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WILEY

ORIGINAL ARTICLE

Psychopathology, cognition and outcome in Dutch and immigrant first-episode psychosis patients

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Aim: The primary aim was to examine differences in baseline symptom expression, neurocognition, social cognition and psychosocial functioning between Dutch, first-generation immigrants and second-generation immigrants with a first-episode psychosis (FEP). The secondary aim was to examine functional and symptomatic change and between-group differences at 12-months follow-up. Associations between migration, baseline characteristics and outcome were explored.

Methods: Forty-six Dutch, 56 second-generation- and 60 first-generation immigrant patients completed baseline measures for 6 symptom dimensions (positive symptoms, negative symptoms, neurocognitive functioning, social cognitive functioning, excitement and emotional distress) and 5 domains of psychosocial functioning (general functioning, work and study, relationships, self-care and disturbing behaviour). Functioning and psychotic symptoms were assessed at baseline and 12-months follow-up. ANCOVA and *t* tests were used to assess between-group differences. General linear models were used to explore within-group differences. Backward-regression was used to explore predictors of outcome.

Results: Levels of positive symptoms, excitement and emotional distress did not differ between groups at baseline or follow-up. Dutch patients had lower levels of negative symptoms than both immigrant groups at follow-up. On neurocognition and social cognition, Dutch performed better than second-generation immigrants, who in turn performed better than first-generation immigrants. Psychosocial functioning across all domains at baseline and at 12-months follow-up was similar across groups. Baseline levels of general psychosocial functioning and income were the strongest predictors of outcome at follow-up.

Conclusions: Psychosocial functioning and symptom profiles are comparable between Dutch, first-generation immigrant and second-generation immigrant FEP patients, excluding neurocognitive and social cognitive deficits. A range of baseline characteristics predicted outcome.

KEYWORDS

cognitive deficits, first-episode psychosis, functional recovery, migration, psychopathology

1 | INTRODUCTION

The incidence of psychotic disorders in immigrants is about double the rate found in non-immigrant populations (Bourque, van der Ven, & Malla, 2011; Veling et al., 2006). Patterns of symptom expression and comorbidity may also differ between immigrant- and non-immigrant patients with psychosis (Bhugra, 2004), as affective dimensions tend to be more salient in some immigrant groups (Veling, Selten, Mackenbach, & Hoek, 2007). Differences between immigrant- and non-immigrant patients with a first-episode psychosis (FEP) on other core symptom domains, such as neurocognitive and social cognitive functioning, have hardly been studied (Stouten, Veling, van der Helm, Laan, & van der Gaag, 2013). These differences in risk and phenotype of psychosis are most likely determined by psychosocial and environmental mechanisms, such as ethnic density, perceived discrimination and other experiences of social adversity and exclusion (Morgan, Charalambides, Hutchinson, & Murray, 2010; Veling & Susser, 2011).

Less is known about differences between immigrant- and non-immigrant FEP patients in functional- and symptomatic outcome of psychotic disorders, and how these relate to differences in baseline illness dimensions. Early studies suggested better prognosis among immigrant FEP patients in the United Kingdom, perhaps related to a relatively more affective and acute profile of psychosis in these groups (McKenzie et al., 1995, 2001), but a recent review of UK studies concluded that there is insufficient evidence of high quality (Chorlton, McKenzie, Morgan, & Doody, 2012). A Dutch study found a comparable functional outcome after 2 years in Dutch and immigrant FEP patients (Selten et al., 2007).

To our knowledge, there are no studies that have investigated differences between immigrant- and non-immigrant FEP patients across the full range of illness dimensions (Van Der Ven, Bourque, Joober, Selten, & Malla, 2012) and subsequently linked them to symptom remission and functional outcome domains like vocational/academic performance, personal relationships; self-care and disturbing behaviour (Lin, Wood, & Yung, 2013; Mausbach, Moore, Bowie, Cardenas, & Patterson, 2009). To investigate variability in symptom expression in psychosis and the impact of baseline illness dimensions on functional- and symptomatic outcome, a multi-dimensional approach of psychotic disorders, psychopathology as well as social functioning is required (van Os & Kapur, 2009). Five primary symptom dimensions have been proposed within the psychosis spectrum: *psychosis*; *negative symptoms; cognitive symptoms (*neurocognition and social cognition); *emotional distress* and *excitement/mania* (Dominguez, Viechtbauer, Simons, van Os, & Krabbendam, 2009; Van Os & Kapur, 2009). Of these dimensions, severe negative symptoms and impaired cognitive functioning are generally associated to poorer outcome (Galderisi et al., 2012; Toulopoulou et al., 2007), whereas predominant affective symptoms and excitement are associated to better outcome (Jarbin, Ott, & Von, 2003; Tohen et al., 2000).

1.1 | Aims of the study

The primary aim of the present study was to examine differences in symptom expression, neurocognitive and social cognitive performance, and psychosocial functioning between Dutch, first-generation immigrants and second-generation immigrants with a first-episode psychosis (FEP) at first presentation in a large sample of patients with first-episode psychosis. The secondary aim was to examine functional and symptomatic change and between-group differences at 12-months follow-up. Furthermore, associations between migration subgroup membership, baseline characteristics and both functional and symptomatic outcome were explored.

2 | MATERIAL AND METHOD

2.1 | Classification of ethnicity

Concepts such as "ethnicity" are intrinsically hard to capture in a single variable. A wide range of conceptual en methodological approaches have been used to capture this concept (Comstock, Castillo, & Lindsay, 2004; Lin & Kelsey, 2000). In the present study "ethnicity" was operationalized using to the criteria of Dutch Bureau of Statistics (Central Bureau of Statistics, n.d.), as are commonly used for studies conducted in The Netherlands (Stronks, Kulu-Glasgow, & Agyemang, 2009). Using this approach, data were collected for all patients on their country of birth and the country of birth of both their biological parents. Subsequently, patients who were born in The Netherlands with 2 parents who were also born in the The Netherlands, were classified as *Dutch*. Those who were born in The Netherlands and had at least 1 parent born abroad, were categorized as *second-generation immigrant*, and those who were born abroad, were categorized as *first-generation immigrant*.

2.2 | Subjects

The study was conducted in the period December 1, 2009 to December 31, 2012. Inclusion criteria: all patients who (1) were referred to the department for non-affective early psychosis in The Hague, (2) were diagnosed with a psychotic disorder, were included in the study. Exclusion criteria: patients were excluded if they (1) did not complete the assessment procedures at baseline, (2) did not complete the assessment procedures at 12-months follow-up. The diagnostic protocol is described in full details elsewhere (Stouten, Veling, Laan, van der Helm, & van der Gaag, 2015; Stouten, Veling, Laan, van der Helm, & van der Gaag, 2014). The study sample consisted of 162 patients diagnosed with a first episode of a psychotic disorder (81 schizophrenia spectrum disorder, 9 schizoaffective disorder, 9 brief psychotic disorder, 5 delusional disorder, 2 shared psychotic disorder and 56 psychotic disorder NOS). In total, 46 patients were classified as "Dutch," 56 as 'second-generation immigrant" (Data on the countries of birth for the parents of the second- and first-generation immigrants are presented in Table A2 in Appendix A) and 60 as "first-generation immigrant" (Country of birth: Morocco: N = 11; The Netherlands Antilles: N = 3; Surinam: N = 14; Turkey: N = 4; Other, Western: N = 7; Other, non-Western: N = 18). All diagnostic and assessment procedures were administered in Dutch. In 4 cases (all first-generation immigrants), diagnostic- and assessment procedures were administered with the help of a professional translator. The study was approved by the local Medical Ethics Committee (reference number NL31561.098.10). Informed written consent was obtained from all participants.

2.3 | Measures

2.3.1 | Demographic variables

Age (years) was age at first contact. Years of education were calculated by adding the completed years of education in primary, secondary and tertiary or higher education. Duration of untreated psychosis (DUP) (in weeks) was calculated by subtracting the (estimated) date of the first positive symptom (as estimated by the patient) from the date of first contact with our department and dividing the number of days by 7.

The Hague consists of 44 neighbourhoods, classified according to postal codes, with a maximum number of 38 000 inhabitants per neighbourhood. The ethnic density for each patient was computed as the proportion of residents in their own neighbourhood belonging to

his or her own specific ethnic group, selected out of the 7 ethnic subcategories, as distinguished by the Dutch Bureau of Statistics (Central Bureau of Statistics, n.d.): (1) Dutch, (2) Morocco, (3) The Netherlands Antilles, (4) Surinam, (5) Turkey, (6) western(ized) countries, for example, northern, southern or western Europe, the former Yugoslavia, the USA, Canada, Australia, New Zealand, Japan or former Netherlands East Indies and (7) all other (non-western) countries.

2.3.2 | Cognitive performance

A comprehensive psychological test-battery was construed to assess the symptom dimensions neurocognitive and social cognitive functioning.

Neurocognitive assessment included assessment of the subdomains *attention* (Continuous Performance Task, CPT 3-7 version) (Nuechterlein & Dawson, 1984), *problem solving* (Wechsler Adult Intelligence Scale, WAIS III, Block design; Tower of London) (Shallice, 1982; Wechsler, 1997) *speed of processing* (WAIS III, Digit-symbol coding; Trail making task, part A) (Reitan, 1958; Wechsler, 1997), *verbal fluency* (Category fluency, animal naming) (Lezak, Howieson, & Loring, 2004), *verbal learning* (Rey Auditory Verbal learning Task, RAVLT) (Kalverboer & Deelman, 1986; Rey, 1964), *visual learning* (Brief Visuospatial Memory Task Revised, BVMT-R) (Benedict, 2007), *working memory* (WAIS III, Letter-number sequencing) (Wechsler, 1997) and *general cognition* (WAIS III, Information and Calculations) (Wechsler, 1997).

Social cognition measures included assessment of the subdomains *emotion perception* (Amsterdam Neuropsychological Tasks, ANT) (Sonneville, 2005), *theory of mind* (Hinting Task) (Corcoran, Mercer, & Frith, 1995), *social knowledge* (WAIS III, picture arrangement) (Wechsler, 1997) and *social cognitive biases* (Davos Assessment of Cognitive Biases Scale) (Bastiaens et al., 2013; van der Gaag et al., 2013). There is currently no clear consensus on what task or tasks should be used to assess social knowledge in the early stages of psychosis (Pinkham, Penn, Green, & Harvey, 2016; van Donkersgoed, Wunderink, Nieboer, Aleman, & Pijnenborg, 2015). We argue that the WAIS-III picture arrangement task taps into the construct of social knowledge, since it assesses knowledge about relationships between an individual's thoughts, feelings, behavioural actions and related responses or consequences in social context.

2.3.3 | Symptoms dimensions

We used the Positive and Negative Syndrome Scale (PANSS) (Kay, Flszbein, & Opfer, 1987) to assess positive and negative symptoms as well as general psychopathology. Six symptom dimensions were computed: positive symptoms; negative symptoms; neurocognitive functioning; social cognitive functioning; excitement and emotional distress (see also "Data analysis" and Table A1).

2.3.4 | Psychosocial functioning

The Personal and Social Performance scale (PSP) (Morosini, Magliano, Brambilla, Ugolini, & Pioli, 2000) was used to assess dimensions of psychosocial functioning (range 0-100, where higher scores reflect better functioning). The PSP uses 4 subscales to assess problems in specific social functioning domains: (1) Social useful activities including study and work (SUA), (2) Personal and social relationships (PSR), (3) Self-care and care for personal environment (S-C) and (4) Disturbing and/or aggressive behaviour (DAB). Higher subscale scores reflect more problems.

2.4 | Data analysis

The analyses were performed in SPSS version 22. To assess the 4 symptom dimensions, we followed the 5-factor model to restructure the related items from the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987), as described by Van der Gaag et al. (2006). Their cross-validation of the PANSS items yielded 25 items that loaded on the same factor in all 10 examined datasets. We used these items to present the following symptom dimension through 4 single-solution confirmatory factor analyses: *positive symptoms* (items P1, P3, G9, P6 and P5), *negative symptoms* (items N6, N1, N2, N4, G7, N3, G16 and G8), *excitement* (G14, P4, P7 and G8) and *emotional distress* (items G2, G6, G3 and G4) (see Table A1). To obtain 1 variable for symptomatic outcome, the remission tool variable was computed by adding the 8 related PANSS items form the PANSS (ie, P1, P2, P3, N1, N4, N6, G5, G9; Structured Clinical Interview for Symptoms of Remission for the PANSS: SCI-SR) (Opler, Yang, Caleo, & Alberti, 2007).

Scores per cognitive task were standardized for each cognitive variable using normative data and then averaged per cognitive subdomain (see also Stouten et al., 2015). To further reduce the number of cognitive variables, the sets of neurocognitive and social cognitive variables were collapsed into 2 separate variables using 2 single-solution confirmatory factor analyses (see Table A1).

ANOVA was used to assess between-group differences on demographic variables. To further explore these differences, significant findings were followed up with independent sample *t* tests between groups. Non-parametric tests were used to assess differences between groups on gender.

ANCOVA was used to assess between-group differences on psychopathological-, cognitive- and psychosocial functioning scores, using demographic variables that significantly differed between groups as covariates (primary aim). To further explore these differences, significant findings were again followed up with independent sample *t* tests between groups.

ANCOVA was used to assess between-group differences on functional- and symptomatic outcome (secondary aim). Within-group functional- and symptomatic changes between baseline and 12-months follow-up were assessed for the 3 groups using general linear models.

To explore predictors of both functional- and symptomatic outcome, we constructed backward regression models predicting functional and symptomatic outcome at 12-months follow-up, including all baseline demographic-, cognitive-, symptom dimensions and migration subgroup membership as predictors in all models (exploratory aim).

As a post-hoc examination of possible language-related assessment bias in our study, scores on verbal learning and visual learning were compared within each of the study groups using general linear models.

3 | RESULTS

3.1 | Diagnoses and demographic data

Distribution of the schizophrenia and psychotic disorder NOS diagnoses were equally distributed across the study groups (Kruskal-Wallis test; P = .202). Demographic variables for Dutch, second- and first-generation immigrants on demographic variables are presented in Table 1.

The 3 groups showed significant differences on age, annual income, years of education and ethnic density. Second-generation immigrants were younger on average at first contact compared to both other groups. Dutch patients had a higher average income than second-generation immigrants, and the latter had a higher average income than first-generation immigrants. First-generation immigrants received less education on average compared to both other groups. Dutch patients more often resided in an area of the city where they belonged to the ethnic majority, where immigrants more often resided in an area of the city where they belonged to an ethnic minority (see Table 1).

3.2 | Neurocognition and social cognition

Mean standardized scores for neurocognitive and social cognitive subdomains for Dutch, second- and first-generation immigrants are presented in Table 2.

Examination of neurocognitive and social cognitive differences between these groups showed marked differences (see Table 2). These differences showed a distinct pattern, where Dutch had smaller deficits than second-generation immigrants, where the latter had smaller deficits than first-generation immigrants. Only deficits in social cognitive biases and facial affect perception did not differ between groups. The observed differences all remained significant after adjusting for age, income, years of education and ethnic density (ANCOVA).

3.3 | Psychopathology and psychosocial functioning

Scale scores for positive symptoms, negative symptoms, excitement, emotional distress and the SCI-SR at baseline and at 12-months follow-up for Dutch, second- and first-generation immigrants are presented in Table 3. Mean scores for general psychosocial functioning, and deficits in work and study, social relationship, self-care and disturbing behaviour at baseline and at 12-months follow-up for these groups are presented in Table 4.

3.4 | Psychopathology at baseline and 12-months follow-up

Within-group comparison of the 4 symptom dimensions and the SCI-SR showed that all patient groups showed symptomatic improvement in the first 12 months after diagnosis across all domains, except for negative symptoms (see Table 3). The level of positive symptoms lowered in second-generation immigrants, where the level of excitement lowered in Dutch and second-generation immigrants. Levels of emotional distress lowered in all 3 groups, where Dutch and second-generation immigrants also obtained significantly higher rates of overall remission.

Analysis of between-group differences in symptoms at baseline yielded no significant differences, controlling for age, income, years of education and ethnic density (ANCOVA). At 12-months follow-up the study groups showed significant differences on negative symptoms (F = 2.81, P = .042), where post-hoc analysis showed that Dutch patients had fewer negative symptoms than both other groups (Dutch-GEN1: t = −2.61, P = .010; Dutch-GEN2: t = −2.80, P = .006).

3.5 | Psychosocial functioning at baseline and 12-months follow-up

Within-group comparison of general psychosocial functioning and the 4 subdomains showed that both immigrant groups showed functional improvement in the first 12 months after diagnosis, where the Dutch group did not (see Table 4). General psychosocial functioning and vocational/academic performance improved in second-generation immigrants, where social relationship improved in both immigrant groups. And lastly, self-care improved in first-generation immigrants.

Analysis of between-group differences in psychosocial functioning at baseline and 12-months follow-up yielded no significant differences, controlling for age, income, years of education and ethnic density (ANCOVA).

3.6 | Predicting symptomatic and functional outcome at 12-months follow-up

Level of symptomatic remission at 12-months was predicted by general psychosocial functioning at baseline and level of symptomatic

TABLE 1 Demographic variables for the 3 study groups

	Dutch		GEN2		GEN1		Between-group comparison		
	M	SD	*M*	SD	*M*	SD	*F*	*P* (*F*)	Post-hoc
N (% male)	46	(80%)	56	(70%)	60	(65%)	2.84[a]	.241	—
Age	28.43	8.26	24.33	5.09	29.79	5.44	7.40	<.001	G2 < D = G1
Annual income (x 1000)	25.34	10.27	17.91	5.35	17.85	5.31	16.34	<.001	D > G2 = G1
Years of education	12.84	2.19	12.12	2.25	11.35	2.40	3.59	.015	D = G2 > G1
DUP (in wk)	77.66	88.96	54.20	71.74	62.68	69.92	0.85	.467	—
Ethnic density (%)	55.77	23.03	11.14	6.93	11.81	7.13	109.64	<.001	D > G2 = G1

Abbreviations: GEN1, first-generation immigrant; GEN2, second-generation immigrant.

[a] χ^2 test statistic.

TABLE 2 Neurocognitive and social cognitive variables for the 3 study groups

	Dutch		GEN2		GEN1		Between-group comparison		
	M	SD	*M*	SD	*M*	SD	*F*	*P* (*F*)	Post-hoc
Neurocognition									
Attention	−1.18	3.10	−2.15	3.09	−2.58	3.24	2.63	.049	D > G2 = G1
Problem solving	−0.43	1.10	−1.20	1.05	−1.51	1.18	9.16	<.001	D > G2 = G1
Processing speed	−0.71	2.37	−1.92	3.14	−2.72	2.97	5.30	.002	D > G2 = G1
Working memory	−0.16	1.15	−0.51	0.92	−1.08	1.03	4.64	.004	G2 = D > G1
Verbal fluency	−0.25	0.95	−0.71	1.20	−1.26	0.98	13.37	<.001	D > G2 > G1
Verbal learning	−0.36	1.44	−0.75	1.54	−1.32	1.97	3.36	.020	G2 = D > G1
Visual learning	−0.42	1.30	−0.74	1.35	−1.30	1.41	6.30	<.001	G2 = D > G1
General neurocognition	−0.13	1.15	−0.55	1.04	−1.10	1.03	11.94	<.001	D > G2 > G1
Social cognition									
Social knowledge	−0.70	1.01	−1.03	1.13	−1.54	1.16	6.47	<.001	G2 = D > G1
Theory of mind	−0.37	0.25	−0.46	0.35	−0.64	0.33	9.00	<.001	G2 = D > G1
Social cognitive biases	−1.56	1.92	−1.19	2.09	−1.17	1.81	0.24	.872	—
Facial affect perception	−1.01	0.87	−1.30	2.05	−1.77	1.73	1.25	.294	—

Abbreviations: GEN1, first-generation immigrant; GEN2, second-generation immigrant. All between group comparisons controlled for age, income, years of education and ethnic density (ANCOVA).

TABLE 3 Symptom expression at baseline and at 12-mo follow-up for the 3 study groups

		Baseline		12 months		Within-subject change	
	Range (min-max)	*M*	SD	*M*	SD	*F*	*P* (*F*)
Dutch							
Positive symptoms	5–35	11.35	5.13	10.47	3.70	1.08	.305
Negative symptoms	7-49	12.07	5.08	10.92	4.17	2.24	.142
Excitement	4-28	5.58	1.57	4.91	1.20	8.41	.006
Emotional distress	4–28	8.33	3.45	7.03	2.16	4.09	.050
PANSS remission tool (SCI-SR)	0–8	1.02	1.10	0.63	0.93	8.81	.005
Second-generation immigrants							
Positive symptoms	5–35	12.16	5.23	10.29	3.88	7.79	.007
Negative symptoms	7–49	14.96	6.47	13.49	4.74	3.98	.052
Excitement	4–28	5.72	2.26	4.92	1.70	10.99	.002
Emotional distress	4–28	9.07	3.91	6.81	2.19	17.47	<.001
PANSS remission tool (SCI-SR)	0–8	1.35	1.30	0.98	1.13	6.37	.015
First-generation immigrants							
Positive symptoms	5–35	11.64	5.34	11.33	3.95	0.20	.656
Negative symptoms	7–49	14.41	5.91	13.60	6.10	1.88	.176
Excitement	4–28	5.35	1.66	4.99	1.33	2.18	.145
Emotional distress	4–28	8.68	3.50	6.97	2.78	11.14	.002
PANSS remission tool (SCI-SR)	0–8	1.41	1.44	1.27	1.37	0.89	.350

Abbreviation: SCI-SR, Structured Clinical Interview for Symptoms of Remission for the PANSS. All between group comparisons controlled for age, income, years of education and ethnic density (ANCOVA).

remission at baseline (F = 32.99, P < .001). Both general psychosocial functioning (F = 27.42, P < .001) and social performance (F = 17.17, P < .001) at 12-months were predicted by general psychosocial functioning at baseline and annual income. Vocational/academic functioning at 12-months was predicted by general psychosocial functioning at baseline and negative symptoms at baseline (F = 20.45, P < .001). Self-care at 12-months was predicted by migration group membership, ethnic density and emotional distress at baseline (F = 2.90, P = .025). And lastly, disturbing behaviour was predicted by years of education, income and neurocognition (F = 3.61, P = .008).

3.7 | Language-related assessment bias

To investigate possible language-related assessment bias in our sample, standardized scores on the verbal learning and visual learning tasks (which used uniform methodology) were compared within the migration-subgroups (see Table 2). These analyses showed that verbal- and visual memory functioning deficits were identical within Dutch (F = 0.214; P = .645; *ns*), second-generation immigrants (F = 0.010; P = .920; *ns*) and first-generation immigrants (F = 0.003; P = .953; *ns*).

TABLE 4 Psychosocial functioning at baseline and at 12-mo follow-up for the 3 study groups

		Baseline		12 months		Within subject change	
	Range (min-max)	*M*	SD	*M*	SD	*F*	*P* (*F*)
Dutch							
General psychosocial functioning	0–100	56.06	13.19	58.09	14.46	1.02	.316
Problems per subdomain:							
Work and study	0–4	2.39	1.19	2.11	1.16	2.60	.113
Relationships	0–4	2.15	0.92	2.02	1.02	0.96	.332
Self-care	0-4	0.63	0.88	0.54	0.82	0.64	.428
Disturbing behaviour	0-4	0.39	0.63	0.37	0.73	0.04	.837
Second-generation immigrants							
General psychosocial functioning	0–100	50.36	15.96	55.66	16.04	10.76	.002
Problems per subdomain:							
Work and study	0–4	2.60	1.13	2.34	1.25	4.89	.030
Relationships	0–4	2.27	1.06	1.91	1.14	10.69	.002
Self-care	0–4	0.56	0.85	0.56	0.86	0.00	1.000
Disturbing behaviour	0–4	0.81	1.21	0.41	0.89	6.29	.014
First-generation immigrants							
General psychosocial functioning	0–100	51.67	14.78	54.01	16.50	2.56	.114
Problems per subdomain:							
Work and study	0–4	2.63	0.92	2.41	1.03	3.84	.054
Relationships	0–4	2.21	1.02	1.93	1.17	7.54	.008
Self-care	0-4	0.51	0.88	0.81	1.08	6.52	.013
Disturbing behaviour	0–4	0.59	1.14	0.50	1.09	0.45	.506

All between group comparisons controlled for age, income, years of education and ethnic density (ANCOVA).

4 | DISCUSSION

Our primary aim was to examine differences in symptom expression, neurocognition and social cognition between Dutch, first-generation immigrants and second-generation immigrants with a first-episode psychosis (FEP). Levels of positive symptoms, excitement and emotional distress did not differ between the 3 groups at baseline nor at 12-months follow-up. Dutch patients had lower levels of negative symptoms than both immigrant groups at 12-months follow-up. On neurocognitive and social cognitive domains, Dutch performed better than second-generation immigrants, who in turn performed better than first-generation immigrants.

Our secondary aim was to examine the level of symptomatic- and functional differences within and between these groups. The 3 groups showed similar levels of general psychosocial functioning and comparable problems with work/study, relationships, self-care and disturbing/aggressive behaviour, both at baseline and at 12-months follow-up. All groups showed symptomatic recovery in 1 or more symptom domains in the first 12 months after first contact. The only symptom domain that did not change in the first 12 months after first contact in any of the groups was negative symptoms. Average psychosocial social functioning in Dutch patients did not improve over the follow-up period. In contrast, relationships and self-care improved in first-generation immigrants, and all functional domains except self-care improved in second-generation immigrants.

And lastly, we explored associations between migration subgroup membership, baseline characteristics and both functional and symptomatic outcome. Baseline levels of general psychosocial functioning and income were the strongest predictors of outcome at 12-months follow-up, supplemented by baseline level of symptomatic remission, negative symptoms, emotional distress, years of education, migration group membership, ethnic density and neurocognition. Immigrant group membership overall did not appear to be a key predictor across outcome models. However, immigrant group membership was the strongest predictor of self-care at 12-months follow-up, supplemented by ethnic density and emotional distress.

Compared to other first-episode studies, overall psychotic symptoms were moderate to low in this sample (eg, Barder et al., 2013; Chang et al., 2011; Lin et al., 2013; Lucas, Redoblado-Hodge, Shores, Brennan, & Harris, 2008; Torgalsbøen, Mohn, & Rishovd Rund, 2014). But even though previous studies indicate that immigrants might have slightly more affective symptoms than non-immigrants (McKenzie et al., 1995, 2001; Shaw et al., 2012; Veling et al., 2007), the present study could not replicate this finding. In contrast, result show that Dutch patients had lower levels of negative symptoms than both immigrant groups at 12-months follow-up. Overall, there do not appear to be any clear indicators that the core psychopathology of psychosis manifest differently in patients with different migration background (Veling et al., 2007).

Second, neurocognitive and social cognitive functioning differentiate between the Dutch and immigrants, but also between first- and second-generation immigrants. A general pattern was observed of Dutch performing better than second-generation immigrants, who performed better than first-generation immigrants. However,

interpretation of these differences is not straightforward. Primarily because cross-cultural assessment of cognitive functioning is a thoroughly complex issue in itself (Pedraza & Mungas, 2008), but also because there are no previous first-episode studies on cognition on possible differences between patients with different migration backgrounds (Stouten et al., 2013).

Considering possible assessment bias, the direction of the observed general cognitive differences between groups suggests a prominent role for language bias, that is, the observed effect follows the same pattern as might be expected based on the (presumed; not assessed) level of mastery of the Dutch language across groups (high>moderate>low). To investigate this issue, our key verbal learning and visual learning task were compared within each of the ethnic groups. This comparison showed that verbal and visual memory problems were of identical size in all 3 groups. These findings suggest that the impact of assessment-language on cognitive scores in the present study is likely to be little (Ji & Nisbett, 2004; Stouten et al., 2013), although measurement bias (Pedraza & Mungas, 2008; Stouten et al., 2013; te Nijenhuis & van der Flier, 2001) cannot be ruled out. A final post-hoc analyses showed that cognitive differences between groups were also not explained by differences in age or years of education or (see Table 1). Nevertheless, taking all the above into account, caution is required when interpreting or generalizing these findings because of heterogeneity and lack of a suitable theoretical framework in which to integrate them.

Third, the 3 groups had similar levels of psychosocial functioning in the first year after intake. Since migration is considered a prominent risk factor for psychosis (Selten, Cantor-Graae, & Kahn, 2007; van Os, Kenis, Rutten, & van Os, 2010; Veling & Susser, 2011), it is surprising that migration-related differences in functional outcome of psychotic disorders have not been studied more extensively. Early UK studies on general functional outcome in samples with patients from varying migration backgrounds showed marginally better functional outcome in immigrants compared to non-immigrants (McKenzie et al., 1995, 2001). More recent Dutch data showed no significant differences in psychosocial functioning between the 3 groups (Veling et al., 2007). The present results illustrate that short-term functional outcome is not better or worse for immigrant patient compared to non-immigrants, neither in general levels of functioning, but also not in key subdomains like vocational and academic performance, relationships or self-care (Veling et al., 2007).

In our exploratory analyses of demographic-, psychopathological- and cognitive predictors of psychosocial functioning and symptomatic recovery at 12-months follow-up yielded several point of interest (see Table 5).

First, 12 months is rather a short follow-up period. As a (partial) result from this, we found large predictive values for baseline functioning as predictor of future functioning (across several domains) and for baseline symptomatic remission as predictor of future symptomatic remission. Longitudinal follow-up of this sample will enable us to study how these associations develop over time and what (other) baseline predictors will increase in value with extended follow-up periods.

Second, although previous research indicates a central role for negative symptoms in functional change in FEP patients (Albert et al., 2011; Álvarez-Jiménez et al., 2012; Brill et al., 2009; Galderisi et al., 2012; González-Ortega et al., 2013; Milev, Ho, Arndt, & Andreasen, 2005), the present data only replicated this association in the area of vocational/academic functioning.

Third, higher income appears to be a predictor of (short-term) poorer functional outcome across multiple domains in the present sample. Although counter-intuitive, this finding is in line a number of previous studies (Mäkikyrö et al., 1997; Mulvany et al., 2001; Timms, 1998). Although a recent review concluded that there is not enough evidence to support the association between social class and psychosis (Kwok, 2014), it has previously been hypothesized that the genetic predisposition for a high IQ (and subsequent higher levels of education and higher levels of annual income) may be associated with the genetic basis of schizophrenia (Aylward, Walker, & Bettes, 1984).

Fourth, in contrast to previous findings duration of untreated psychosis did not contribute to the prediction of (short-term) outcome in the present sample (Norman, Lewis, & Marshall, 2005). To a lesser degree, this was also the case for neurocognitive (Allott et al., 2013; Allott, Liu, Proffitt, & Killackey, 2011) and social cognitive deficits (Fett et al., 2011), even though neurocognitive deficits at baseline did predict the level of disturbing behaviour at 12-months follow-up. Disturbing behaviour of patients with a psychotic disorder (although rare) is a major public health concern, affecting patients and their environment (Serper, 2011). Previous research indicated several environmental (eg, drug use (Foley et al., 2005)) and clinical dimensions (eg, neurocognitive performance (Serper, Beech, Harvey, & Dill, 2008) and excitement (Huber et al., 2012)) that contributed to the manifestation of aggressive behaviour. Although our findings did not confirm the predictive value of excitement, our data support higher levels of baseline neurocognitive performance as predictor of less disturbing behaviour in FEP patients.

And lastly, migration group membership and ethnic density generally did not appear to have a marked impact on (short-term) outcome, except for the outcome domain "self-care." Although this finding might reflect that in the present study only the first-generation immigrant group showed improvement across the study period in this domain. Unfortunately there is no similar study to contrast these results and to examine whether or not this could be a relevant finding. This issue warrants further study.

The absence of data on medication- and cannabis use at the time of the study should be considered as limitations when interpreting the findings. However, impact of both short-term anti-psychotic medication (Mishara & Goldberg, 2004; Nielsen et al., 2015; Woodward, Purdon, Meltzer, & Zald, 2007) and/or cannabis use (Schubart et al., 2011; Yücel et al., 2010) on the observed associations is likely to be small as well as heterogeneous. Another limitation is that language ability was not assessed. Even though our post-hoc analysis yielded no clear indicator of language effects on our cognitive data (as mentioned above), masked effects of language skills on our data cannot be ruled out. And lastly, we did not asses cultural effects that impact general information processing styles that may have impacted our data ("analytic" vs "holistic"; eg, Nisbett, Peng, Choi, & Norenzayan, 2001; Park & Huang, 2010; Varnum, Grossmann, Kitayama, & Nisbett, 2010). We argue a lot of future research is needed to

TABLE 5 Regression models prediction symptomatic and functional outcome at 12-mo follow-up

Outcome domains at 12-mo follow-up	Baseline predictors	Beta	R^2	F	*P* (F)
Level of symptomatic remission	Level of symptomatic remission	0.543***	0.450	32.99	<.001
	General psychosocial functioning	−0.234***			
General psychosocial functioning	General psychosocial functioning	0.583***	0.310	27.42	<.001
	Annual income	−0.230**			
Work and study	General psychosocial functioning	0.432***	0.251	20.45	<.001
	Negative symptoms	−0.165*			
Relationships	General psychosocial functioning	0.497***	0.299	17.17	<.001
	Annual income	−0.190*			
Self-care	Migration group membership	0.312*	0.088	2.90	.025
	Ethnic density	0.258*			
	Emotional distress	−0.180*			
Disturbing behaviour	Years of education	0.251**	0.107	3.61	.008
	Annual income	−0.201*			
	Neurocognition	0.180*			

*$P \leq .05$; **$P \leq .01$; ***$P \leq .001$.

integrate such conceptual models with the clinical setting in which FEP patients are assessed and treated. Considering the current state of this novel field of study, interpretation and generalization of cross-cultural findings like the ones presented here should be done with caution.

The major strength of this study is that, to our knowledge, it is the first study to assess differences between patients with different migration background in psychopathology, neurocognition, social cognition and both psychosocial as well as symptomatic outcome in 1 large FEP sample. Furthermore, our study is the first to explore the prospective impact of 6 key symptom dimensions across 3 groups from different migration background. The high representativeness of this early psychosis sample, that is, including all consecutive patients with a first-episode psychosis from 1 large urban area who completed baseline measures within 3 months after first contact, further adds to this strength.

Overall, the present study shows that psychosis appears to manifest similarly across Dutch, first- and second-generation immigrants (Van Der Ven et al., 2012), where only neurocognitive, social cognitive performance, and to a lesser degree negative symptoms, appear to differentiate between these groups. Functional limitations over the first year after diagnosis also appear to be comparable. Nevertheless, the observed differences in functional and symptomatic outcome over the 12-months follow-up, and the observation that this change appears to have different predictors across migration-subgroups, might indicate subtle but important etiological differences underlying functional problems in first-episode psychosis patients from various migration backgrounds (van Os et al., 2010).

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APPENDIX

TABLE A1 Factor construction

Factor	Item	Domain	Factor loading
Positive symptoms			
	P1	Delusions	.879
	G9	Unusual thought content	.807
	P6	Suspiciousness	.682
	P3	Hallucinations	.603
	P5	Grandiosity	.528
Negative symptoms			
	N1	Blunted affect	.869
	N3	Poor rapport	.818
	N6	Lack of spontaneity	.812
	N2	Emotional withdrawal	.762
	N4	Apathetic social withdrawal	.745
	G7	Motor retardation	.722
	G16	Active social avoidance	.360
Neurocognition			
	WM	Working memory	.811
	GC	General cognition	.746
	Att	Attention	.742
	VeL	Verbal learning	.729
	PSo	Problem solving	.729
	ViL	Visual learning	.699
	PSp	Processing speed	.622
	VF	Verbal fluency	.620
Social cognition			
	ToM	Theory of Mind	.752
	SK	Social knowledge	.720
	ER	Facial affect perception	.486
	CB	Social cognitive biases	.067
Excitement			
	P7	Hostility	.846
	G8	Uncooperativeness	.733
	G14	Poor impulse control	.648
	P4	Excitement	.512
Emotional distress			
	G2	Anxiety	.805
	G6	Depression	.767
	G4	Tension	.733
	G3	Guilt	.597

TABLE A2 Ethnic background of the first and second generation immigrant groups (crosstabs)

		Country of birth, mother							
Country of birth, father		1	2	3	4	5	6	7	Total
First-generation immigrants									
1	The Netherlands	1	0	0	0	0	0	0	*1*
2	Morocco	1	11	0	0	0	0	0	*12*
3	The Netherlands Antilles	0	0	1	0	0	0	1	*2*
4	Surinam	0	0	0	16	0	0	0	*16*
5	Turkey	0	0	0	0	4	0	0	*4*
6	Other, western	0	0	0	0	0	7	0	*7*
7	Other, non-Western	1	0	0	0	0	0	17	*18*
	Total	*3*	*11*	*1*	*16*	*4*	*7*	*18*	*60*
Second-generation immigrants									
1	The Netherlands	0	0	0	0	0	3	1	*4*
2	Morocco	1	14	0	0	0	0	0	*15*
3	The Netherlands Antilles	0	0	0	0	0	0	0	*0*
4	Surinam	1	0	0	20	0	0	0	*21*
5	Turkey	0	0	0	0	7	0	1	*8*
6	Other, western	0	0	0	0	0	1	0	*1*
7	Other, non-Western	1	0	0	0	1	1	4	*7*
	Total	*3*	*14*	*0*	*20*	*8*	*5*	*6*	*56*